AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A synthetic peptide comprising an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41; wherein the HR1 region consists of ~~native~~ amino acid sequence as shown ~~as~~ in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the HR1 region sequence comprises a hydrophobic domain of amino acids corresponding to amino acid residues in positions 28 to 36 of SEQ ID NO:1 or polymorphisms thereof; wherein the amino acid residues comprising the hydrophobic domain correspond to heptad repeat positions "efgabcdef"; and wherein the amino acid sequence of the synthetic peptide further comprises one or more amino acid substitutions in the heptad repeat positions "efgabcdef" comprising the hydrophobic domain, as compared to the ~~native~~ amino acid sequence of ~~the HR1 region~~ SEQ ID NO:1, which enables synthetic peptide to self-assemble in solution into trimers.

Claim 2 (original): The synthetic peptide according to claim 1, wherein the one or more amino acid substitutions in the hydrophobic domain comprise either a substitution in the "c" position, or a substitution in both the "g" position and the "c" position, of the heptad repeat positions "efgabcdef".

Claim 3 (currently amended): The synthetic peptide according to claim 2, wherein the synthetic peptide comprises ~~an~~ a further amino acid substitution ~~additional~~ in addition to a substitution in either the "c" position or both the "g" position and "c" position, wherein the ~~additional~~ further amino acid substitution is in one or more amino acid positions of one or more heptads of the synthetic peptide, and wherein the one or more amino acid positions is selected from the group consisting of an "a" position, a "d" position, a "b" position, and a combination thereof.

Claim 4 (currently amended): The synthetic peptide according to claim 1, wherein the one or more amino acid substitutions in the hydrophobic domain comprising the heptad repeat positions ~~"efgabcdef"~~ "$e_1f_2g_3a_4b_5c_6d_7e_8f_9$" are in a position of the heptad repeat positions selected from the group consisting of ~~a C-terminal "e"~~ an "e_8" position, ~~a C-terminal "f"~~ an "f_9" position, and a combination thereof.

Claim 5 (original): The synthetic peptide according to claim 4, wherein the synthetic peptide comprises an amino acid substitution additional to the substitution in one or more of the "e" position and the "f" position, wherein the additional amino acid substitution is in one or more amino acid positions of one or more heptads of the synthetic peptide, and wherein the one or more amino acid positions is selected from the group consisting of the "a" position, a "d" position, a "b" position, and a combination thereof.

Claim 6 (currently amended): The synthetic peptide according to claim 1, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 7 (currently amended): The synthetic peptide according to claim 2, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 8 (currently amended): The synthetic peptide according to claim 3, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid

~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 9 (currently amended): The synthetic peptide according to claim 4, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 10 (currently amended): The synthetic peptide according to claim 5, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 11 (original): A trimer formed from synthetic peptide according to claim 1.

Claim 12 (currently amended): The trimer according to claim 11, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 13 (original): A trimer formed from synthetic peptide according to claim 2.

Claim 14 (currently amended): The trimer according to claim 13, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 15 (original): A trimer formed from synthetic peptide according to claim 3.

Claim 16 (currently amended): The trimer according to claim 15, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 17 (original): A trimer formed from synthetic peptide according to claim 4.

Claim 18 (currently amended): The trimer according to claim 17, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 19 (original): A trimer formed from synthetic peptide according to claim 5.

Claim 20 (currently amended): The trimer according to claim 19, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a

pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 21 (currently amended): A synthetic peptide comprising an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions "efgabcdef" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in either the "c" position of the hydrophobic domain, or in both the "g" position and the "c" position of the hydrophobic domain, as compared to ~~native~~ the sequence of ~~the HR1 region~~ SEQ ID NO:1; wherein the amino acid substitution enables the synthetic peptide to self-associate in solution into trimers.

Claim 22 (currently amended): The synthetic peptide according to claim 21, wherein the synthetic peptide comprises ~~an~~ a further amino acid substitution, as compared to ~~native~~ sequence of ~~the HR1 region~~ SEQ ID NO:1, ~~additional~~ in addition to a substitution in a "c" position or in both the "g" position and "c" position; wherein the ~~additional~~ further amino acid substitution is in one or more heptads of the synthetic peptide; and wherein the ~~additional~~ further amino acid substitution is in one or more amino acid positions selected from the group consisting of an "a" position, a "d" position, a "b" position, and a combination thereof.

Claim 23 (currently amended): The synthetic peptide according to claim 21, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more

than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 24 (currently amended): The synthetic peptide according to claim 22, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 25 (original): A trimer formed from synthetic peptide according to claim 21.

Claim 26 (currently amended): The trimer according to claim 25, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 27 (original): A trimer formed from synthetic peptide according to claim 22.

Claim 28 (currently amended): The trimer according to claim 27, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 29 (currently amended): A synthetic peptide comprising an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues

and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions ~~"efgabcdef"~~ "$e_1f_2g_3a_4b_5c_6d_7e_8f_9$" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in one or more ~~of an "e"~~ "e_8" position ~~at the C-terminus~~ of the hydrophobic domain, an ~~"f"~~ "f_9" position ~~at the C-terminus~~ of the hydrophobic domain, or a combination thereof, as compared to ~~native~~ sequence of ~~the HR1 region~~ SEQ ID NO:1; and wherein the amino acid substitution enables the synthetic peptide to self-associate in solution into trimers.

Claim 30 (currently amended): The synthetic peptide according to claim 29, wherein the synthetic peptide comprises ~~an~~ a further amino acid substitution, as compared to ~~native~~ sequence of the HR1 region of SEQ ID NO:1, ~~additional~~ in addition to the substitution in one or more ~~of an "e"~~ "e_8" position and ~~"f"~~ "f_9" position; wherein the ~~additional~~ further amino acid substitution is in one or more heptads of the synthetic peptide; and wherein the ~~additional~~ further amino acid substitution is in one or more amino acid positions selected from the group consisting of an "a" position, a "d" position, a "b" position, and a combination thereof.

Claim 31 (currently amended): The synthetic peptide according to claim 29, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 32 (currently amended): The synthetic peptide according to claim 30, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid

~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 33 (original): A trimer formed from synthetic peptide according to claim 29.

Claim 34 (currently amended): The trimer according to claim 33, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 35 (original): A trimer formed from synthetic peptide according to claim 30.

Claim 36 (currently amended): The trimer according to claim 35, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 37 (original): A synthetic peptide comprising an amino acid sequence selected from the group of amino acid sequences consisting of: SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:43, SEQ ID NO:81, and SEQ ID NO:82.

Claim 38 (currently amended): The synthetic peptide according to claim 37, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective

group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 39 (original): A trimer formed from synthetic peptide according to claim 37.

Claim 40 (currently amended): The trimer according to claim 39, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 41 (currently amended): A trimer formed from self-association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41; wherein the HR1 region consists of ~~native~~ amino acid sequence as shown ~~as~~ in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the HR1 region sequence comprises a hydrophobic domain of amino acids corresponding to amino acid residues 28 to 36 of SEQ ID NO:1 or polymorphisms thereof; wherein the amino acid residues comprising the hydrophobic domain correspond to heptad repeat positions "efgabcdef"; and wherein the amino acid sequence of the synthetic peptide further comprises one or more amino acid substitutions in the heptad repeat positions "efgabcdef" comprising the hydrophobic domain, as compared to ~~native~~ amino acid sequence of ~~the HR1 region~~ SEQ ID NO:1, which enables synthetic peptide to self-associate in solution into trimers.

Claim 42 (currently amended): The trimer according to claim 39, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~

modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 43 (currently amended): A trimer formed from self-association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions "efgabcdef" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in either the "c" position of the hydrophobic domain, or in both the "g" position and the "c" position of the hydrophobic domain, as compared to ~~native~~ sequence of ~~the HR1 region~~ SEQ ID NO:1; and wherein the amino acid substitution enables the synthetic peptide to self-associate in solution into trimers.

Claim 44 (currently amended): The trimer according to claim 43, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 45 (currently amended): A trimer formed from self-association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence containing ~~native~~ amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions

"efgabcdef" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in either the "c" position of the hydrophobic domain or in both the "g" position and the "c" position of the hydrophobic domain, as compared to sequence of ~~the HR1 region~~ SEQ ID NO:1; wherein the synthetic peptide also comprises ~~an~~ a further amino acid substitution, ~~additional~~ in addition to the substitution in the "c" position or in both the "g" position and "c" position, in one or more heptads of the synthetic peptide; wherein the ~~additional~~ further amino acid substitution is in one or more amino acid positions selected from the group consisting of an "a" position, a "d" position, a "b" position, and a combination thereof; and wherein the amino acid substitutions enable the synthetic peptide to self-associate in solution into trimers.

Claim 46 (currently amended): The trimer according to claim 45, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 47 (currently amended): A trimer formed from self-association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence containing native amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions ~~"efgabcdef"~~ "$e_1f_2g_3a_4b_5c_6d_7e_8f_9$" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in one or more ~~of an "e"~~ "e_8" position ~~at the C-terminus~~ of the hydrophobic domain, an ~~"f"~~ "f_9" position ~~at the C-terminus~~ of the hydrophobic domain, or a combination thereof, as compared to ~~native~~

sequence of ~~the HR1 region~~ SEQ ID NO:1; and wherein the amino acid substitution enables the synthetic peptide to self-associate in solution into trimers.

Claim 48 (currently amended): The trimer according to claim 47, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 49 (currently amended): A trimer formed from self-association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence containing native amino acid sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the amino acid sequence comprises a heptad repeat containing a plurality of heptads, and a hydrophobic domain comprising heptad repeat positions ~~"efgabcdef"~~ "$e_1f_2g_3a_4b_5c_6d_7e_8f_9$" corresponding to amino acids 28 to 36 of SEQ ID NO:1 or a polymorphism occurring in one or more amino acid residues of such sequence as shown in FIG. 2; wherein the synthetic peptide comprises an amino acid substitution in one or more ~~of an "e"~~ "e_8" position ~~at the C-terminus~~ of the hydrophobic domain, an ~~"f"~~ "f_9" position ~~at the C-terminus~~ of the hydrophobic domain, or a combination thereof, as compared to the ~~native~~ sequence of ~~the HR1 region~~ SEQ ID NO:1; wherein the synthetic peptide also comprises ~~an~~ a further amino acid substitution, ~~additional~~ in addition to the substitution in either or both of the ~~"e"~~ "e_8" position and the ~~"f"~~ "f_9" position, in one or more heptads of the synthetic peptide; wherein the ~~additional~~ further amino acid substitution is in one or more amino acid positions selected from the group consisting of an "a" position, a "d" position, a "b" position", and a combination thereof; and wherein the amino acid substitutions enable the synthetic peptide to self-associate in solution into trimers.

Claim 50 (currently amended): The trimer according to claim 49, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~

chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 51 (original): A trimer formed from self association of synthetic peptide in solution, wherein the synthetic peptide comprises an amino acid sequence selected from the group of amino acid sequences consisting of: SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:31, SEQ ID NO:32, SEQ ID NO:34, SEQ ID NO:35, SEQ ID NO:36, SEQ ID NO:37, SEQ ID NO:38, SEQ ID NO:39, SEQ ID NO:40, SEQ ID NO:43, SEQ ID NO:81, and SEQ ID NO:82.

Claim 52 (currently amended): The trimer according to claim 49, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 53 (withdrawn): A method for inhibition of transmission of HIV-1 to a cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 1 in a concentration effective to inhibit infection of the cell by HIV-1, thereby inhibiting transmission of HIV-1 to the cell.

Claim 54 (withdrawn): A method for inhibition of transmission of HIV-1 to a cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 2 in a concentration effective to inhibit infection of the cell by HIV-1, thereby inhibiting transmission of HIV-1 to the cell.

Claim 55 (withdrawn): A method for inhibition of transmission of HIV-1 to a cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 3 in a concentration effective to inhibit infection of the cell by HIV-1, thereby inhibiting transmission of HIV-1 to the cell.

Claim 56 (withdrawn): A method for inhibition of transmission of HIV-1 to a cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 4 in a concentration effective to inhibit infection of the cell by HIV-1, thereby inhibiting transmission of HIV-1 to the cell.

Claim 57 (withdrawn): A method for inhibition of transmission of HIV-1 to a cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 5 in a concentration effective to inhibit infection of the cell by HIV-1, thereby inhibiting transmission of HIV-1 to the cell.

Claim 58 (withdrawn): The method according to claim 53, wherein synthetic peptide further comprises a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 59 (withdrawn): The method according to claim 53, wherein synthetic peptide is in an oligomeric form comprising trimers.

Claim 60 (withdrawn): The method according to claim 59, wherein the trimers further comprise a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimers, and a combination thereof.

Claim 61 (withdrawn): The method of claim 53, wherein the synthetic peptide is parenterally administered to an individual.

Claim 62 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 1 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 63 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 2 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 64 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 3 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 65 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 4 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 66 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 5 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 67 (withdrawn): The method according to claim 62, wherein synthetic peptide further comprises a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 68 (withdrawn): The method according to claim 62, wherein synthetic peptide is in an oligomeric form comprising trimers.

Claim 69 (withdrawn): The method according to claim 68, wherein the trimers further comprise a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimers, and a combination thereof.

Claim 70 (withdrawn): The method of claim 62, wherein synthetic peptide is parenterally administered to an individual.

Claim 71 (withdrawn): A method for inhibiting HIV fusion with a target cell comprising contacting the virus, in the presence of a target cell, with synthetic peptide according to claim 37 in a concentration effective to inhibit membrane fusion between the virus and the cell.

Claims 72-75 (canceled)

Claim 76 (withdrawn): The method according to claim 71, wherein synthetic peptide further comprises a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 77 (withdrawn): The method according to claim 71, wherein synthetic peptide is in an oligomeric form comprising trimers.

Claim 78 (withdrawn): The method according to claim 77, wherein the trimers further comprise a component selected from the group consisting of one or more reactive functionalities, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid substitution comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimers, and a combination thereof.

Claim 79 (withdrawn): The method of claim 71, wherein synthetic peptide is parenterally administered to an individual.

Claim 80 (currently amended): A synthetic peptide comprising an amino acid sequence containing ~~native~~ sequence of greater than ~~14~~ 36 amino acid residues and fewer than 60 amino acid residues in length of HR1 region of HIV-1 gp41 as shown in SEQ ID NO:1; wherein the HR1 region sequence comprises a hydrophobic domain of amino acids corresponding to amino acid residues in positions 28 to 36 of SEQ ID NO:1; wherein the amino acid residues comprising the hydrophobic domain correspond to heptad repeat positions "efgabcdef"; and wherein the amino acid sequence of the synthetic peptide further comprises one or more amino acid substitutions in the heptad repeat positions "efgabcdef" comprising the hydrophobic domain, as compared to the ~~native~~ amino acid sequence of ~~the HR1 region~~ SEQ ID NO:1, which enables synthetic peptide to self-assemble in solution into trimers.

Claim 81 (currently amended): The synthetic peptide according to claim 80, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty amino acids to either or both of the amino terminus or carboxy terminus of the synthetic peptide, and a combination thereof.

Claim 82 (previously presented): A trimer formed from synthetic peptide according to claim 80.

Claim 83 (currently amended): The trimer according to claim 82, further comprising a component selected from the group consisting of one or more ~~reactive functionalities~~ chemical group or moiety capable of forming a covalent bond or protective group, a pharmaceutically acceptable carrier, a macromolecular carrier, an amino acid ~~substitution~~ modification comprising an addition of no less than one amino acid and no more than twenty

amino acids to either or both of the amino terminus or carboxy terminus of synthetic peptide forming the trimer, and a combination thereof.

Claim 84 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 80 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 85 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding synthetic peptide according to claim 81 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 86 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding trimer according to claim 82 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.

Claim 87 (withdrawn): A method for inhibition of transmission of HIV-1 to a target cell comprising adding trimer according to claim 83 to the virus and a target cell in an amount effective to inhibit infection the cell by HIV-1.